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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/823,797

04/14/2004

Takumi Mikawa

60188-835

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11/02/2005

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EXAMINER

SOWARD, IDA M

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/823,797

Applicant(s)

MIKAWA ET AL..

Examiner

Ida M. Soward

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 16-38 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-12 is/are allowed.
- 6) ☒ Claim(s) 1-5 and 13-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4-14-04, 8-20-04, 1-5-05, 9-13-05</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

This Office Action is in response to the election filed October 24, 2005.

### ***Election/Restrictions***

Applicant's election without traverse of claims 1-15 in the reply filed on October 24, 2005 is acknowledged.

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 and 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Bailey (US 2003/0006439 A1).

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In regard to claim 1, Bailey teaches a semiconductor device comprising: a first hydrogen barrier film 1174; a capacitor device 1172 formed on the first hydrogen barrier film 1174; and a second hydrogen barrier film 1186 formed to cover the capacitor device 1172, wherein the first and second hydrogen barrier films 1174 & 1186 each contain at least one common type of atoms (Figure 10B, page 8, paragraphs [0191]0[0192]).

In regard to claim 1 concerning the limitation “for allowing the first and second hydrogen barrier films 1174 & 1186 to adhere to each other”, claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function, *In re Danly*, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). Apparatus claims cover what a device is, not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In regard to claim 2, Bailey teaches around the perimeter of the capacitor device, the first and second hydrogen barrier films 1174 & 1186 adhere to each other (Figure 10B, page 8, paragraphs [0191]-[0192]).

In regard to claim 2 concerning the limitation “the first and second hydrogen barrier films adhering to each other by chemical bonding of the atoms of the common type”, claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function, *In re Danly*, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). Apparatus claims cover what a device is, not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In regard to claim 3, Bailey teaches the atoms being nitrogen atoms or oxygen atoms (page 8, paragraph [0192]).

In regard to claim 4, Bailey teaches a semiconductor device comprising: a first hydrogen barrier film 1174; a capacitor device 1172 formed on the first hydrogen barrier film 1174; and a second hydrogen barrier film 1186 formed to cover the capacitor device 1172, wherein the first and second hydrogen barrier films 1174 & 1186 each contain metal atoms (Figure 10B, page 8, paragraphs [0191]-[0192]).

In regard to claim 4 concerning the limitation “for allowing the first and second hydrogen barrier films to adhere to each other by mutual diffusion action of the metal atoms therebetween, and around the perimeter of the capacitor device, the first and second hydrogen barrier films adhere to each other by the mutual diffusion action of the metal atoms therebetween”, claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function, *In re Danly*, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). Apparatus claims cover what a device is, not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In regard to claim 5, Bailey teaches the metal atoms being Ti (page 8, paragraph [0192]).

In regard to claim 13, Bailey teaches the first and second hydrogen barrier films 1174 & 1186 being made of the same material (page 8, paragraph [0192]).

In regard to claim 14, Bailey teaches a lower electrode 1178 formed above the first hydrogen barrier film 1174, a capacitor insulating film 1180 formed on the lower

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electrode 1178, and an upper electrode 1182 formed on the capacitor insulating film 1180, and the capacitor insulating film 1180 is made of a ferroelectric film (Figure 10B, page 8, paragraphs [0191]-[0192]).

In regard to claim 15, Bailey teaches the capacitor insulating film being made of  $\text{SrBi}_2(\text{Ta}_x\text{Nb}_{1-x})_2\text{O}_9$ ,  $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ,  $(\text{Ba}_x\text{Sr}_{1-x})\text{TiO}_3$  (where x satisfies  $0 < x < 1$  in the above chemical formulas) (page 8, paragraph [0192]).

### ***Allowable Subject Matter***

Claims 6-12 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose, make obvious, or otherwise suggest the structure of the applicant's together with the other limitations of the independent claims, such as:

In regard to claim 6, "the first and second hydrogen barrier films are connected to each other with an adhesion layer interposed therebetween";

In regard to claim 10, "wherein the first and second hydrogen barrier films adhere to each other by oxygen bonding while the oxidized region located around the perimeter of the capacitor device is interposed therebetween"; and

In regard to claim 11, "wherein the first and second hydrogen barrier films adhere to each other by nitrogen bonding while the nitrified region located around the perimeter of the capacitor device is interposed therebetween".

The dependent claims being further limiting and definite are also allowable.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to semiconductor devices having hydrogen barrier films:

Amanuma (US 6,395,612 B1)

Höpfner (US 6,316,275 B2)

Kanaya et al. (US 6,611,014 B1)

Lee et al. (US 6,664,578 B2)

Solayappan et al. (US 6,781,184 B2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ida M. Soward whose telephone number is 571-272-1845. The examiner can normally be reached on Monday - Thursday 6:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IMS

October 30, 2005

*M. Seward*  
*AU 2822*